

CLAIMS:

What is claimed is:

1. A balloon dilatation catheter comprising:

5 a) a proximal catheter shaft portion formed at least in part of an extruded engineering thermoplastic polymeric material with a tensile strength greater than 10,000 psi, an elongation greater than 50% and a tensile modulus greater than 300,000 psi, having proximal and distal ends and having a first inner lumen extending therein to the distal end;

10 b) a distal catheter shaft portion being more flexible than the proximal catheter shaft portion, having proximal and distal ends and a second inner lumen extending from the proximal end of the distal shaft portion to a location proximal to the distal end of the distal catheter shaft portion and being in fluid communication with the first inner lumen
15 extending within the proximal catheter shaft portion; and

c) an expandable dilatation balloon on the distal catheter shaft portion having an interior in fluid communication with the second inner lumen extending within the distal shaft portion.

20 2. The balloon dilatation catheter of claim 1 wherein the polymeric material is a linear aromatic polymer.

3. The balloon dilatation catheter of claim 2 wherein the linear aromatic polymer is selected from the group consisting of
25 polyetheretherketone, polyetherketone, polyketone, polyethereketoneketone, polyaryletherketone, polysulfone and polyether sulfone.

4. The balloon dilatation catheter of claim 1 wherein the polymeric material of the proximal catheter shaft has a tensile strength greater than
30 about 14,000 psi, an elongation greater than about 60% and a tensile modulus greater than about 400,000 psi.

13. The balloon dilatation catheter of claim 5, wherein the outer tubular member is made of the polymeric material.

14. The balloon dilatation catheter of claim 13, wherein the
65 polymeric material is a polyetheretherketone.

15. The balloon dilatation catheter of claim 1, wherein:

[A] a) the polymeric material is a polyetheretherketone having a
tensile strength greater than about 14,000 psi, an elongation greater than
70 about 60 and a tensile modulus greater than about 400,000 psi; and

[B] b) the proximal catheter shaft portion has an outer tubular
member and an inner tubular member which is disposed within the outer
tubular member and which defines with the outer tubular member the first
inner lumen extending therein, at least one of the inner and the outer tubular
75 members being formed of the polyetheretherketone.

16. The balloon dilatation catheter of claim 1 sized and having the
flexibility and pushability required for use as a dilatation catheter for
percutaneous transluminal coronary angioplasty.

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17. The balloon dilatation catheter of claim 16, wherein the
polymeric material is a polyetheretherketone.

18. An intraluminal catheter for percutaneous insertion and
85 transluminal advancement into a patient's vasculature, the catheter having a
shaft comprising:

a) a proximal shaft portion formed at least in part of an
extruded thermoplastic polymeric material with a tensile
strength greater than 10,000 psi; and

90 b) a distal shaft portion that is more flexible than the proximal
shaft portion.

19. The catheter of claim 18, wherein the polymeric material is a polyetheretherketone.

95 20. The intraluminal catheter of claim 18, wherein the extruded thermoplastic polymeric material has an elongation greater than 50%.

21. The catheter of claim 20, wherein the polymeric material is a polyetheretherketone.

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22. The catheter of claim 18, further comprising a lumen extending at least in the distal shaft portion.

105 23. The catheter of claim 22, further comprising a second lumen in the catheter shaft adapted to receive a guidewire, the second lumen extending from a distal port in the distal end of the catheter to a proximal guidewire port proximal of the distal guidewire port.

110 24. The catheter of claim 22, further comprising an expandable dilatation balloon carried by the shaft, wherein the lumen directs inflation fluid to the dilatation balloon.

115 25. The catheter of claim 24, wherein the lumen has a proximal end for receiving inflation fluid and a distal end for directing inflation fluid to the balloon.

120 26. The catheter of claim 18, wherein the shaft has an inner tubular member and an outer tubular member, at least one of the inner and the outer tubular members having a proximal portion formed of the extruded thermoplastic polymeric material.

27. The catheter of claim 26 wherein the polymeric material is a polyetheretherketone.

125 28. The catheter of claim 26, wherein the proximal portion of the
 outer tubular member is made of the extruded thermoplastic polymeric
 material.

130 29. The catheter of claim 28 wherein the extruded thermoplastic
 polymeric material is a polyetheretherketone.

30 The catheter of claim 28, wherein a distal portion of the outer
 tubular member is made of a material more flexible than the extruded
 thermoplastic polymeric material.

135 31. The catheter of claim 18, wherein the extruded thermoplastic
 polymeric material has a tensile modulus greater than 300,000 psi.

32. The catheter of claim 31, wherein the polymeric material is a
 polyetheretherketone.

140 33. The catheter of claim 18, wherein the extruded thermoplastic
 polymeric material has a tensile modulus greater than about 400,000 psi.

145 34. The catheter of claim 33, wherein the polymeric material is a
 polyetheretherketone.

35. The catheter of claim 18, wherein the extruded thermoplastic
 polymeric material has a tensile strength greater than about 14,000 psi.

150 36. The catheter of claim 35, wherein the polymeric material is a
 polyetheretherketone.

37. The catheter of claim 18, wherein the extruded thermoplastic
 polymeric material has an elongation greater than about 60%.

155 38. The catheter of claim 37, wherein the polymeric material is a polyetheretherketone.

39. The catheter of claim 18, wherein the polymeric material has an elongation greater than 50% and a tensile modulus greater than 300,000
160 psi.

40. The catheter of claim 39, wherein the polymeric material is a polyetheretherketone.

165 41. The catheter of claim 18, wherein the polymeric material is a polyetheretherketone having a tensile strength greater than about 14,000 psi, an elongation greater than about 60%, and a tensile modulus greater than about 400,000 psi.

170 42. The catheter of claim 41, wherein the polymeric material is a polyetheretherketone.

43. The catheter of claim 18, sized and having the flexibility and pushability required for percutaneous transluminal coronary angioplasty.

175 44. The catheter of claim 43, wherein the polymeric material is a polyetheretherketone.

45. The catheter of claim 18, sized and having the kink-
180 resistance required for percutaneous transluminal coronary angioplasty.

46. The catheter of claim 45, wherein the polymeric material is a polyetheretherketone.

185 47 The catheter of claim 18, sized and having the flexibility,
pushability, and kink-resistance required for percutaneous transluminal
coronary angioplasty.

48. The catheter of claim 47, wherein the polymeric material is a
polyetheretherketone.

49. The catheter of claim 18, wherein the shaft is about 120 to about 150 cm in length.

195 50. The catheter of claim 49, wherein the polymeric material is a
polyetheretherketone.

51. The catheter of claim 18, wherein the proximal shaft portion comprises an extruded tubular member of the extruded thermoplastic polymeric material.

52. The catheter of claim 51, wherein the polymeric material is a polyetheretherketone.

205 53. An intraluminal catheter for percutaneous insertion and
transluminal advancement into a patient's vasculature, the catheter having a
shaft comprising:

210 a) a proximal shaft portion formed at least in part of an extruded thermoplastic polymeric material with a tensile modulus greater than 300,000 psi; and

b) a distal shaft portion that is more flexible than the proximal shaft portion.

54. The catheter of claim 53, wherein the polymeric material is a
 215 polyetheretherketone.

55. The catheter of claim 53, wherein said extruded thermoplastic polymeric material has an elongation greater than 50%.

220 56. The catheter of claim 55, wherein the polymeric material is a polyetheretherketone.

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